USGS

WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2003GA40B

Title: "A Combined Hydrological , Geochemical and Isotopic Approach to Understanding the Effects of Basin Scale on Base Flow Systematics in the Georgia Piedmont"

Project Type: Research

Focus Categories: Surface Water, Water Quality, Water Quantity

Keywords: Base Flow, Isotope Hydrology, Georgia Piedmont Watersheds, Middle Oconee River basin, Age-dating of water

Start Date: 03/01/2003

End Date: 02/28/2004

Federal Funds Requested: $18000.00

Matching Funds: $40025.00

Congressional District: 5th

Principal Investigators: Rose, Seth E.

Abstract: The proposed research addresses the "scale problem" in surface water hydrology; specifically it focuses upon using isotope and geochemical tracers to assess the effects of basin scale upon base flow generation. It is expected that the temporal and spatial varitions with respect to major ion concentrations, stable oxygen and strontium isotope ratios, environmental tritium concentrations will reveal useful information pertaining to how recharge is eventually processed as base flow within Piedmont Province watersheds. The key question is whether the contribution of water to a large watershed comes solely from small watersheds (i.e. "local flow systems") or whether a regional flow system transports base flow to higher order Piedmont streams. The investigation of seasonal isotopic variability of base flow on different spatial scales along with rainfall and shallow ground water should provide a wealth of interpretable data that can be used to address this question. The proposed utilization of strontium isotope ratios (a tracer of the lithogenic contribution to water chemistry)likely represents the first such study of its kind in this setting. The proposed study area is the Middle Oconee River basin which is located in a relatively underdeveloped region between Atlanta and Athens, Georgia.

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